Imagine COMMUNICATIONS™

Installation and Configuration Manual

SPT™

SPT-TANDBERGTOLXY Serial Protocol Translator– Tandberg Controller For Leitch Routers

Edition A - August 2002

TNDBRGTOLXY MAN

Publication Information

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Chapter 1

General Information

This manual provides information on the features and applications for the Leitch SPT-TANDBERGTOLXY Serial Protocol Translator. It is written for technicians and operators responsible for installation, setup, and/or operation of the product, and is useful to operations personnel for purposes of daily operation and reference.

Writing Conventions

This manual has the following conventions:

- Safety messages or other important types of information are separated from regular text via identifying labels or dividing lines.
- **Bold** text is used to place emphasis on certain words.
- Computer or system information as displayed on a screen, user-required entries, push buttons, or keys shown exactly as they appear on the keyboard or unit are in **Bold Font**.

Also refer to the symbols and safety conventions listed in the *Safety* section of this manual.

Unpacking

All SPT-TANDBERGTOLXY Serial Protocol Translators have been carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble-free service.

1. Check equipment for any visible damage that may have occurred during transit.
2. Confirm that all items listed on the packing list have been received.
3. Contact your Leitch dealer if any item on the packing list is missing.
4. Contact the carrier if any item is damaged.
5. Remove all packaging material before you install the unit.

Shipping

Leitch recommends that you keep at least one set of original packaging in case a product needs to be returned for service. If the original package is not available, you can purchase replacement packaging from Leitch, or supply your own packaging as long as it meets the following criteria:

- Packaging must be able to withstand the product weight.
- The product must be held rigid within the packaging.
- There must be at least two inches of space between the product and the container.
- The corners of the product must be protected.

Products returned for servicing should be shipped to Leitch by prepaid shipment. If the product is still within the warranty period, the product will be returned by prepaid shipment after servicing.

Safety

Carefully review all safety precautions to avoid injury and prevent damage to this product or any products connected to it. You will find a complete list of safety precautions in Appendix A.

IMPORTANT! Only qualified personnel should perform service procedures.

Safety Terms and Symbols in this Manual

DANGER **Statements identifying conditions or practices that will result in severe personal injury or loss of life. High voltage is present.**

WARNING **Statements identifying conditions or practices that may result in personal injury or loss of life. High voltage is present.**

CAUTION **Statements identifying conditions or practices that can result in damage to the equipment or other property.**

Revision History

Edition	*Date*	*Comments*
Edition A	August 2002	Initial release

Chapter 2

Introducing the SPT-TANDBERGTOLXY

Introducing the SPT-TANDBERGTOLXY

The SPT serial protocol translator is a compact adapter that translates between Leitch protocol and protocols used by other manufacturers or equipment. The SPT can be used to integrate otherwise incompatible devices in a system, and it may be used to expand a system beyond the normal limitations imposed by hardware or system design. The SPT is available in several modes, each of which is covered in a separate manual. For a complete list of available models, refer to the *SPT Applications Guide*.

Figure 2-1. SPT Serial Protocol Translator

Applications Involving the SPT-TANDBERGTOLXY

The SPT-TANDBERGTOLXY may be used in conjunction with a Leitch routing switcher to allow control of the switcher via Tandberg Control Console with Prosan protocol support. In this application, the SPT will translate from Prosan protocol to the protocol required by the Leitch routing switcher (see Figure 2-2).

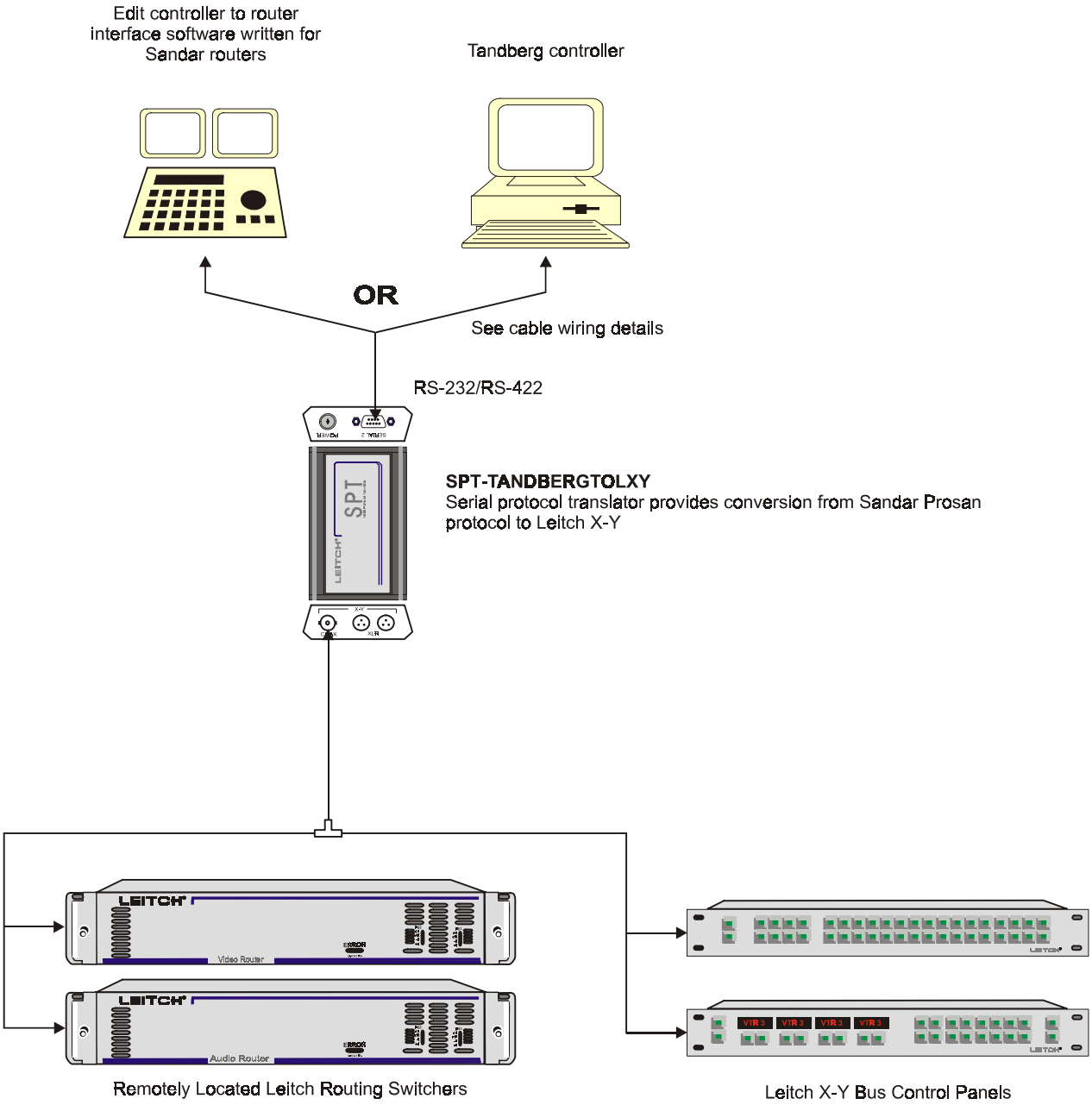

Edit controller to router interface software written for Sandar routers
Tandberg controller
OR
See cable wiring details
RS-232/RS-422
SPT-TANDBERGTOLXY
Serial protocol translator provides conversion from Sandar Prosan protocol to Leitch X-Y
Video Router
Audio Router
Remotely Located Leitch Routing Switchers
Leitch X-Y Bus Control Panels

Figure 2-2. Interfacing to Tandberg Control System

Chapter 3

Installing the SPT-TANDBERGTOLXY

Installing the SPT-TANDBERGTOLXY

The SPT-TANDBERGTOLXY is installed in the control line, as shown in Figure 3-1.

- The maximum allowable distance for each segment of the X-Y coaxial cable run is 2,000 feet (609 meters).
- The maximum length for each RS-232 segment is 50 feet (15 meters).
- The maximum length for each RS-422 segment is 2,000 feet (609 meters).
- There is no limit to the number of control devices added to the X-Y control bus.

Connecting the SPT-TANDBERGTOLXY

Figure 3-1 shows how to connect the SPT-TANDBERGTOLXY from Tandberg controllers to Leitch router frames and control panels. Figure 3-2 shows connector pin assignments for ports configured for RS-232 or RS-422.

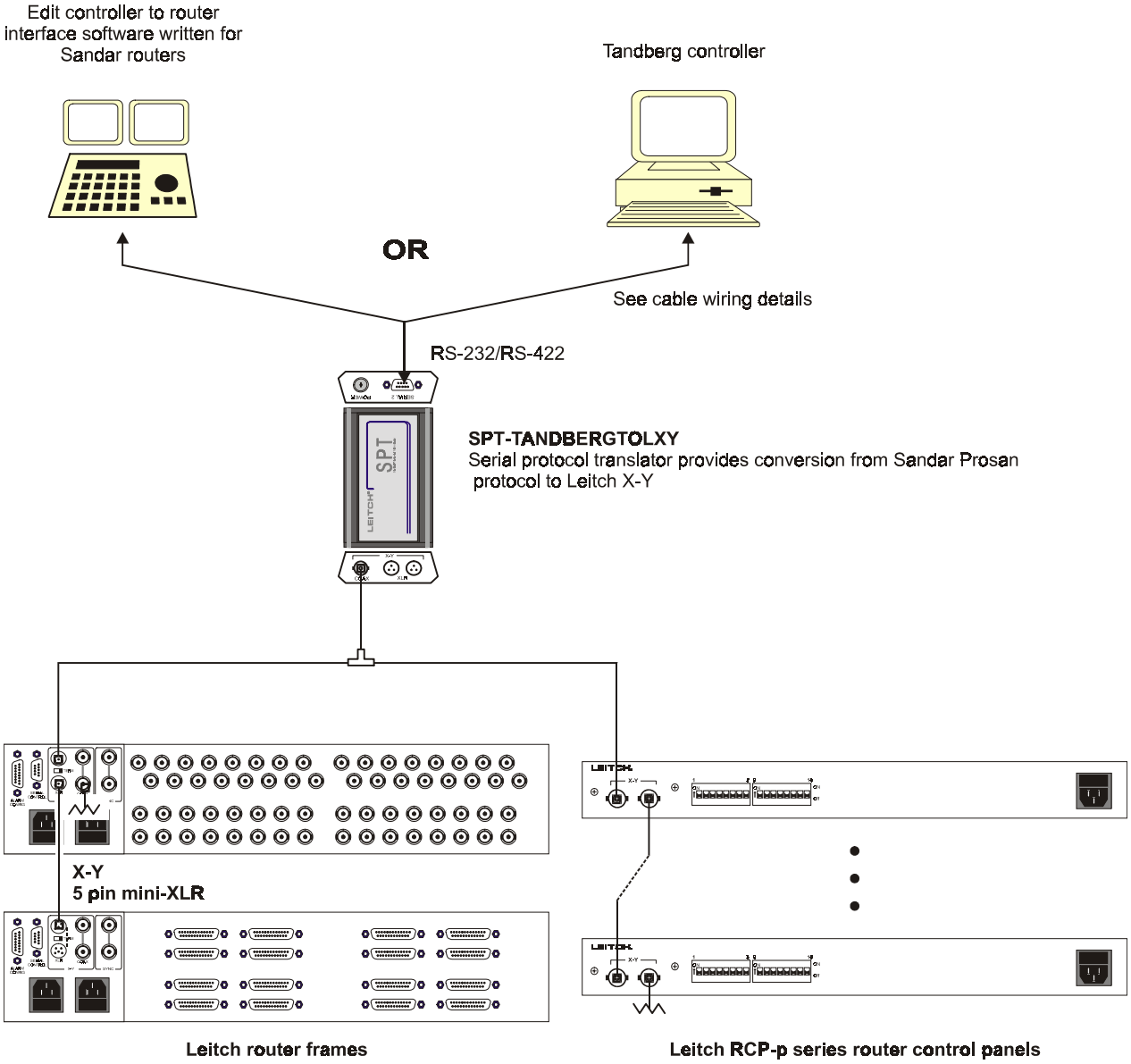

Edit controller to router interface software written for Sandar routers
Tandberg controller
OR
See cable wiring details
RS-232/RS-422
SPT-TANDBERGTOLXY
Serial protocol translator provides conversion from Sandar Prosan protocol to Leitch X-Y
X-Y
5 pin mini-XLR
Leitch router frames
Leitch RCP-p series router control panels

Figure 3-1. Connecting the SPT-TANDBERGTOLXY

Port Configured For RS-232		Port Configured For RS-422	
Pin	**Function**	**Pin**	**Function**
1		1	Frame Ground
2	RxD (Data Received by Router)	2	Ta (Data Sent by Router)
3	TxD (Data Sent by Router)	3	Rb (Data Received by Router)
4		4	Receiver Common
5	Ground	5	
6		6	Transmit Common
7		7	Tb (Data Sent by Router)
8		8	Ra (Data Received by Router)
9		9	Frame Ground

DB-9 Male

Figure 3-2. Serial Connector Pin Assignments

Cable Wiring Details

Figure 3-3 shows the connector pin assignments on both ends of the connection; the cable wiring description is shown between the connectors. Figure 3-4 shows the cable wiring details for connecting the SPT-TANDBERGTOLXY to a Tandberg controller.

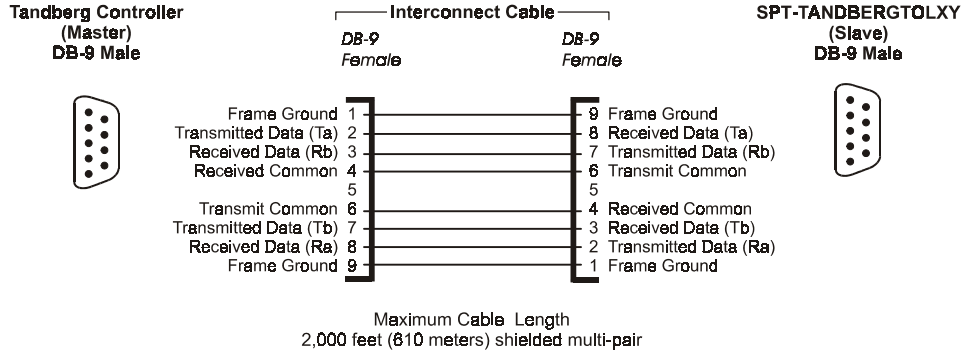


Figure 3-3. Cable Wiring Details for SPT-TANDBERGTOLXY

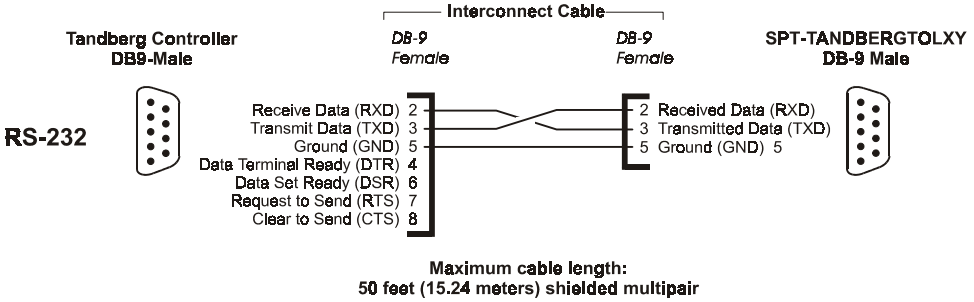


Figure 3-4. Cable Wiring Details for SPT-TANDBERGTOLXY to Tandberg Controller

Chapter 4

Configuring the SPT-TANDBERGTOLXY

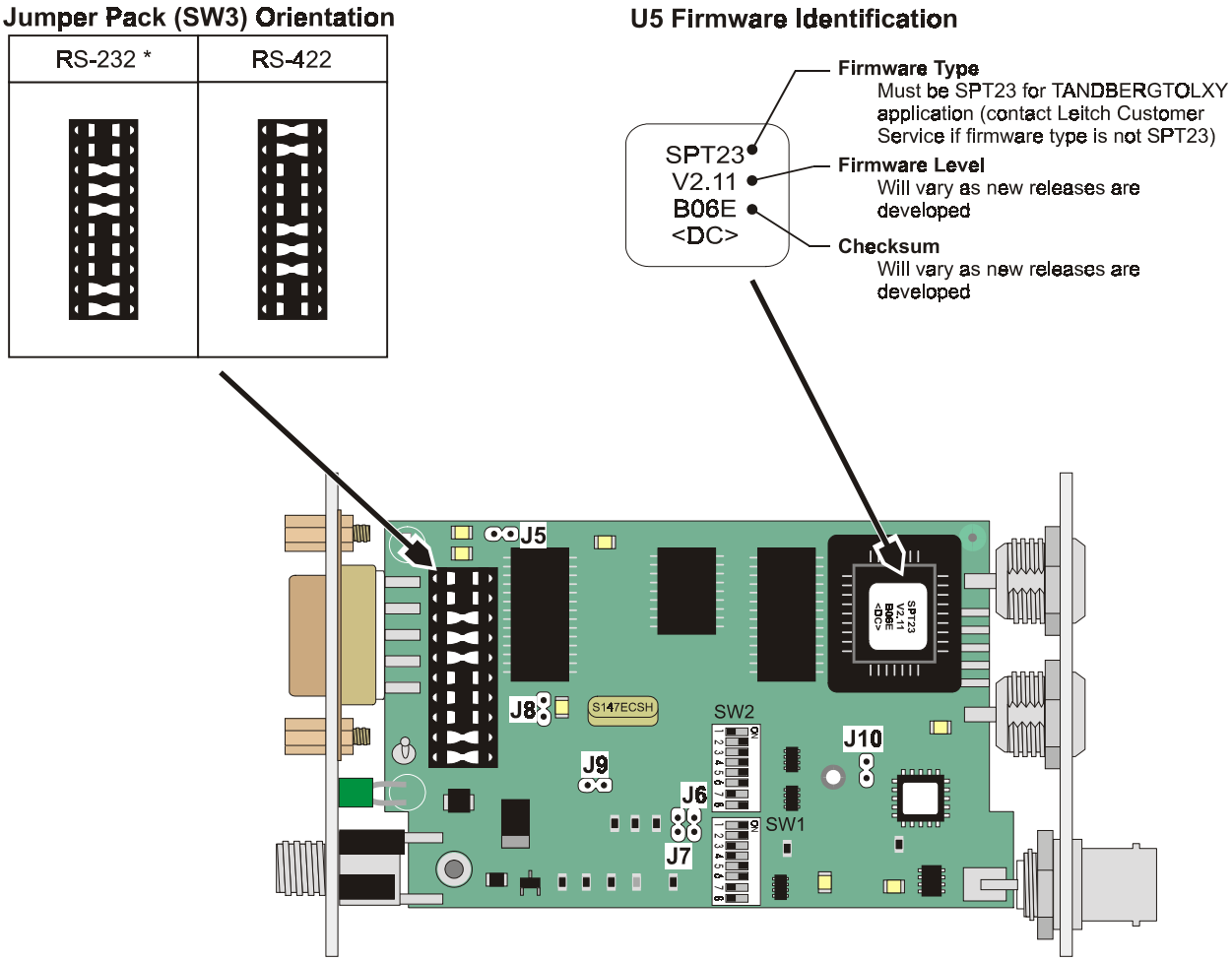
Configuring the SPT-TANDBERGTOLXY

Note: *Always update the label on the back of the SPT housing whenever the DIP switch or jumper settings are changed.*

The SPT-TANDBERGTOLXY is shipped from the factory preconfigured for use. In most cases, you will not need to reconfigure the SPT. The following parameters, however, you can reconfigure:

Reconfigurable Setting	Factory Default Setting
RS-232 or RS-422 operation	RS-232
Serial port baud rate	9600 baud
X-Y on XLR termination (the XLR ports must be terminated if the SPT is located at the end of the bus)	Terminated
Source 1 for disconnect	Yes
3-digit formatting	Yes
SPT address (ID)	0

Reconfiguration is accomplished via DIP switch and jumper settings, as shown in Figure 4-1 and Figure 4-2.

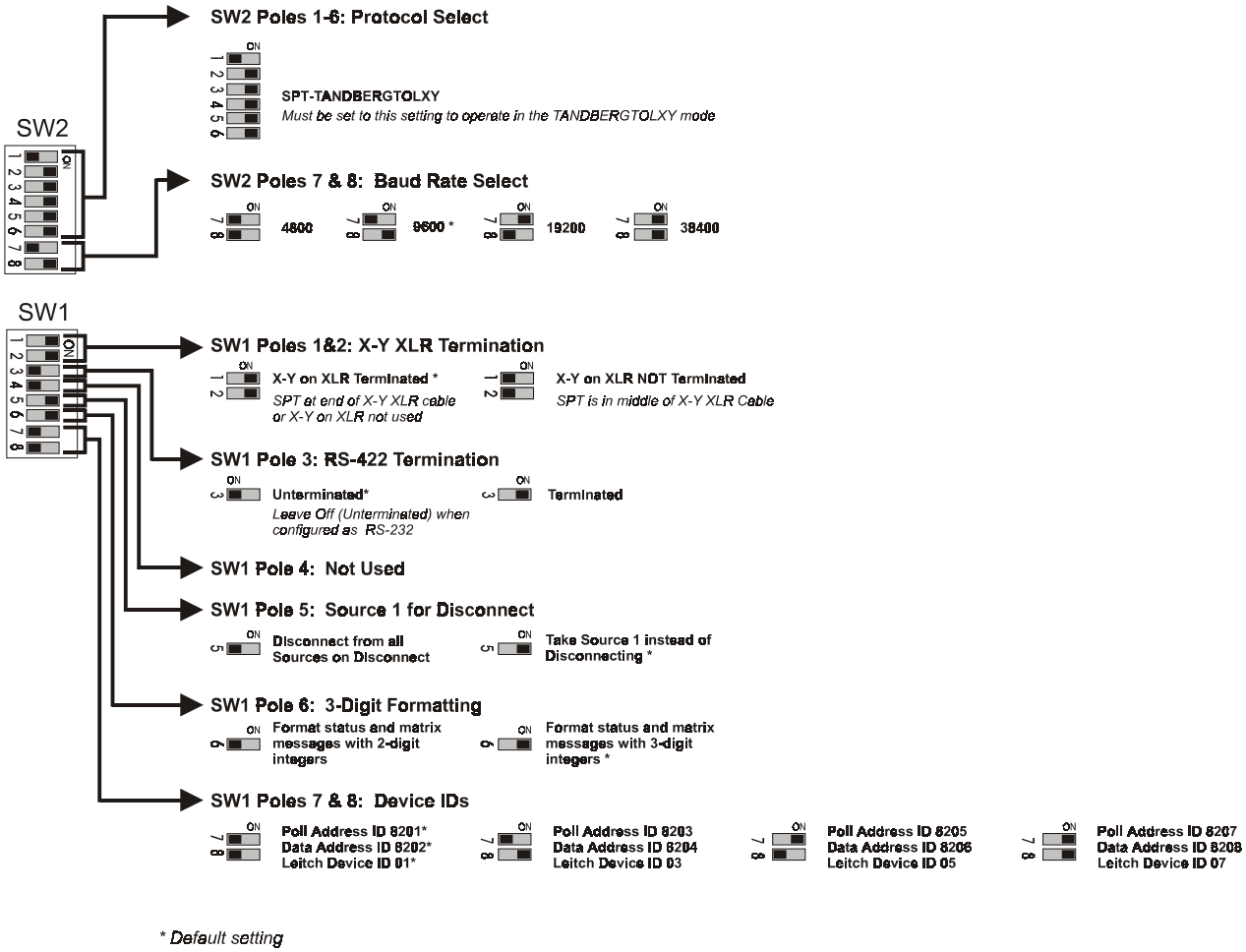


Suitcase Jumpers

Jumper Designator	Setting
J5	Not installed
J6	Not installed
J7	Not installed
J8	Not installed
J9	Not installed
J10	Not installed

** Default setting*

Figure 4-1. DIP Switch and Jumper Locations


SW2
SW2 Poles 1-6: Protocol Select
SPT-TANDBERGTOLXY
Must be set to this setting to operate in the TANDBERGTOLXY mode
SW2 Poles 7 & 8: Baud Rate Select
4800
9600 *
19200
38400
SW1
SW1 Poles 1&2: X-Y XLR Termination
X-Y on XLR Terminated *
SPT at end of X-Y XLR cable or X-Y on XLR not used
X-Y on XLR NOT Terminated
SPT is in middle of X-Y XLR Cable
SW1 Pole 3: RS-422 Termination
Unterminated*
Leave Off (Unterminated) when configured as RS-232
Terminated
SW1 Pole 4: Not Used
SW1 Pole 5: Source 1 for Disconnect
Disconnect from all Sources on Disconnect
Take Source 1 instead of Disconnecting *
SW1 Pole 6: 3-Digit Formatting
Format status and matrix messages with 2-digit integers
Format status and matrix messages with 3-digit integers *
SW1 Poles 7 & 8: Device IDs
Poll Address ID 8201*
Data Address ID 8202*
Leitch Device ID 01*
Poll Address ID 8203
Data Address ID 8204
Leitch Device ID 03
Poll Address ID 8205
Data Address ID 8206
Leitch Device ID 05
Poll Address ID 8207
Data Address ID 8208
Leitch Device ID 07

** Default setting*

Figure 4-2. DIP Switch Settings

Reassembling the Unit

To avoid damage to the SPT-TANDBERGTOLXY circuitry, the unit must be reassembled as shown in Figure 4-3. Note that one of the four standoffs on the underside of the bottom cover has been removed. Orient the cover so that this area is positioned directly over U1. If U1 is positioned under an intact standoff, the standoff will press against the component, and possibly cause damage to the unit.

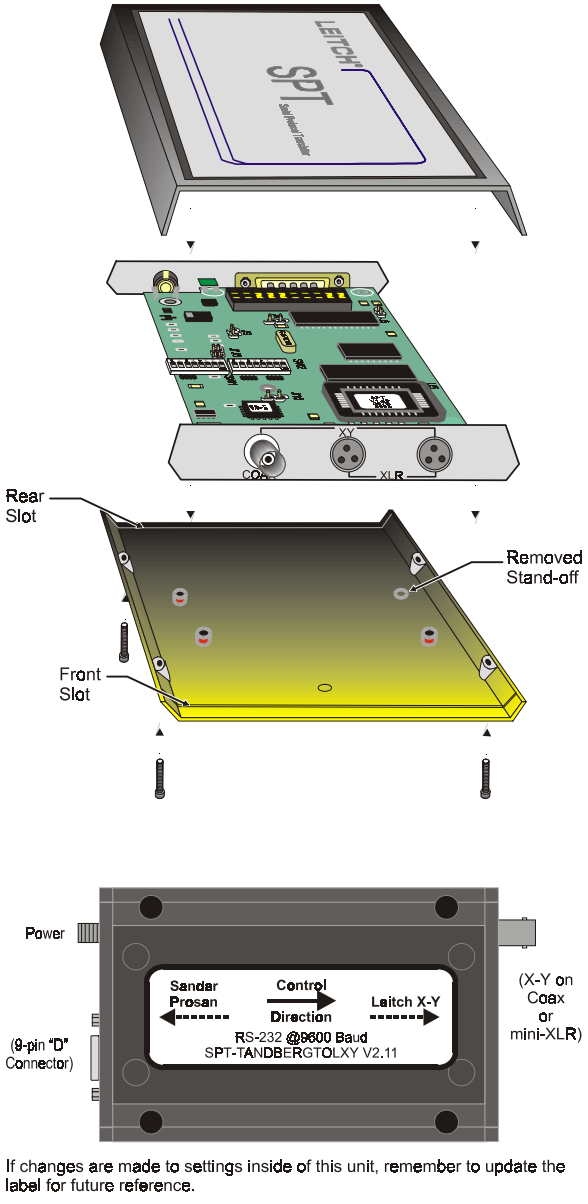


Figure 4-3. Reassembling the Unit

Protocol Notes

The SPT-TANDBERGTOLXY uses RS-232 protocol to translate Tandberg controller messages into Leitch X-Y messages, to command devices on the Leitch X-Y bus. Similarly, the SPT-TANDBERGTOLXY translates Leitch X-Y status and response messages into Tandberg messages to alert the Tandberg controller of command responses and changes in status. When the SPT-TANDBERGTOLXY powers up, it requires approximately 45 seconds to update the internal status table. During this time the SPT-TANDBERGTOLXY cannot respond to the Tandberg controller. Once the internal status table is built, the Tandberg controller will be alerted with a reset message and a series of crosspoint status messages advising the current crosspoint information. Following these messages the Tandberg controller can transmit messages to the SPT-TANDBERGTOLXY.

The Sandar Prosan protocol is an ACK/NAK protocol; that is, each message sent will receive an immediate response indicating that the message is either acknowledged (ACK) or not acknowledged (NAK).

- The SPT-TANDBERGTOLXY will "acknowledge" any message with the correct checksum without regard to the command or message content.
- The SPT-TANDBERGTOLXY will "not acknowledge" messages with the incorrect checksum.

Likewise, if messages sent from the SPT-TANDBERGTOLXY to the host are neither acknowledged or not acknowledged within a 2-second timeframe, the message will be retransmitted. The message will be transmitted up to 3 times before attempts to send the message are abandoned.

The SPT-TANDBERGTOLXY will stop all communication to and from the Tandberg controller if it detects a loss of communication with the Leitch router. Once the SPT-TANDBERGTOLXY reestablishes communication with the router, it will reopen communication to the Tandberg controller. Allow the SPT-TANDBERGTOLXY approximately 30 to 40 seconds to determine loss of or to reestablish communication.

Configuration Control

Source 1 for Disconnect (SW1 Pole 5)

The SW1 Pole 5 bit provides a selectable parameter "native" to Sandar Prosan protocol, which allows you to inhibit disconnecting a destination from sources altogether. The factory default is to set this bit to the ON position.

- When bit 5 is ON, the SPT-TANDBERGTOLXY will internally substitute the disconnect code 000 (or 00) with the value for Source 1. In this mode, a disconnect request will always result in a connection to Source 1.
- When bit 5 is OFF, the SPT-TANDBERGTOLXY will make no internal substitutions for the disconnect code; the destination will be disconnected from all sources.

Three-Digit Formatting (SW1 Pole 6)

The SW1 Pole 6 bit provides a selectable parameter "native" to Sandar Prosan protocol, which allows you to specify how many digits (2 or 3) with which values for Matrix and Status Response messages are formatted. The factory default is to set this bit to the ON position.

- When bit 6 is ON, source and destination values will be formatted with 3 digits (for example: 001).
  - Here is an example of a Status response message formatted in 3-digit mode: SA:001,002,003,004,005,006,007,008.
  - Here is an example of a Matrix message formatted in 3-digit mode: M001:001,002,003,004,005,006,007,008.
- When bit 6 is OFF, source and destination values will be formatted with 2 digits (for example: 01).
  - Here is an example of a Status response message formatted in 3-digit mode: SA:01,02,03,04,05,06,07,08.
  - Here is an example of a Matrix message formatted in 3-digit mode: M01:01,02,03,04,05,06,07,08.

Device IDs (SW1 Poles 7 and 8)

The SW1 Poles 7 and 8 provides a selectable address range. Sandar Prosan protocols require a device to have two addresses starting at the value 8200. The addresses are referred to as the Poll Address (which is always odd) and the Data Address (which is always even).

- The Leitch Device ID (which is seen by Leitch products on the X-Y bus) is the DIP switch value (see Table 4–1).
- The Poll Address of the SPT is the constant value 8200 added to the DIP switch value selected (see Table 4–1).
- The Data Address is equal to the Poll Address plus 1 (see Table 4–1).

Table 4–1 shows SW1 poles 7 and 8 DIP switch settings with corresponding Leitch device IDs, Poll Addresses, and Data Addresses.

Table 4–1. SPT-TANDBERGTOLXY Device IDs

SW1 Poles 7 / 8 DIP Switch settings	Leitch Device ID (DIP Switch value)	Poll Address	Data Address
00	01	8201	8202
01	03	8203	8204
10	05	8205	8206
11	07	8207	8208

Protocol Commands

The SPT-TANDBERGTOLXY protocol supports the following Prosan message types. These message types are explained in detail in subsequent sections.

- Alarm
- Text Name
- Matrix Status
- Change Matrix Status
- Polling
- Reset
- Matrix Size
- Linked Level Offset
- Host Controller Release Number
- Tributary Information

Alarm Messages (A)

The SPT-TANDBERGTOLXY supports these alarm status messages:

- 00 — No alarm
- 02 — Frame communication failure
- 03 — Hardware problem (fan, power supply etc.)

Text Name Messages (DO and DI)

Text names furnished in the response have the following forms:

- For inputs:
  I<3 digit decimal, 1-based number of input>IN<space><3 digit decimal, 1-based number of input><space><space>

  Example: I010IN 010

- For outputs:
  O<3 digit decimal, 1-based number of input>OUT<space><3 digit decimal, 1-based number of input><space>

  Example: O010OUT 010

Matrix Status Messages (S or M)

Refer to the *Sandar Prosan Protocol User Manual* for an explanation of Matrix Status Messages.

Change Matrix Status Messages (M)

Only one Matrix Status Response message will be issued for each level specified in the command message. Other levels in the message will be expressed with the "don't care/no change" (---) parameter.

For example:

Request: M001:001,002, 003
Responses: M001:001
M001:---,002
M001:---,---,003

Polling Messages (Q)

Resulting responses will be Q00.

Reset Messages (R)

Following a reset, a delay of approximately 45 seconds will follow. During the delay period, the unit restatuses and rebuilds internal crosspoint information based on the current Leitch router system status. After the delay status, information (M messages) will be sent to the Tandberg controlling device.

Matrix Size (XD001, XD002, XD003, XD004)

Refer to the *Sandar Proscan Protocol User Manual* for an explanation of Matrix Size messages.

Linked Level Offset (XD005)

The Linked Level Offset feature is supported by neither the SPT-TANDBERGTOLXY nor Leitch router equipment. As such, the following static response indicates that there are no linked level offsets: XD005:000,000,000,000,000,000,000,000.

Host Controller Release Number Messages (XR)

The response message will contain a string similar to SPT-Sandar v2.11.

Tributary Information (XTA)

Neither the SPT-TANDBERGTOLXY nor Leitch router equipment support Tributary Information. The response message will always be XTA:NONE.

Reference

This documentation used the following reference for implementing the protocol translation:

User Manual
Sandar Prosan Protocol
SC2000 Matrix Controller from Release 2.9 991001
TeleCast Norge AS
Sandefjord Norway

Appendix A

Safety

Carefully observe the safety alert symbols below for dangers, warnings, and cautions. They alert installers and operators of possible dangers or important information contained in this manual.

Keep in mind, though, that warnings alone do not eliminate hazards, nor are they a substitute for safe operating techniques and proper accident prevention measures.

IMPORTANT! Only qualified personnel should perform service procedures.

Safety Terms and Symbols in this Manual

⚠ DANGER **Statements identifying conditions or practices that will result in severe personal injury or loss of life. High voltage is present.**

⚠ WARNING **Statements identifying conditions or practices that may result in personal injury or loss of life. High voltage is present.**

⚠ CAUTION **Statements identifying conditions or practices that can result in damage to the equipment or other property.**

Safety Terms and Symbols on the Product

DANGER: High voltage and indicates a personal injury hazard immediately accessible as one reads the marking.

WARNING: Indicates a personal injury hazard not immediately accessible as one reads the marking.

CAUTION: Indicates a hazard to property, including the product, or to pay attention and refer to the manual.

Protective ground (earth) terminal.

Fuse. Replace with same type and rating of fuse.

Zur Vermeidung von Feuer verwenden Sie nur Sicherungen mit der für dieses Produkt geforderten Typ und Stromstärke.

Preventing Electrostatic Discharge

Observe precautions for handling electrostatic sensitive devices.

CAUTION: Electrostatic discharge (ESD) can damage components in the product. To prevent ESD, observe these precautions when directed to do so:

1. ***Use a Ground Strap.*** Wear a grounded antistatic wrist strap to discharge the static voltage from your body while installing or removing sensitive components.
2. ***Use a Safe Work Area.*** Do not use any devices capable of generating or holding a static charge in the work area where you install or remove sensitive components. Avoid handling sensitive components in areas that have a floor or benchtop surface capable of generating a static charge.
3. ***Handle Components Carefully.*** Do not slide sensitive components over any surface. Do not touch exposed connector pins. Handle sensitive components as little as possible.
4. ***Transport and Store Carefully.*** Transport and store sensitive components in a static-protected bag or container.

Injury Precautions

WARNING

Potentially lethal voltages are present within the frame during normal operation. The AC power cord must be disconnected from the frame before the top panel is removed. (In frames with multiple power supplies, remove ALL power cords.) Power should not be applied to the frame while the top is open unless properly trained personnel are servicing the unit.

Pull out the plug from the main socket before the removal of a cover.

Przod zdjeciem pokrywy wyciagnac wtyczke z gniazda sieciowego.

WARNING: *SHOCK HAZARD - DO NOT OPEN.*
AVIS: *RISQUE DE CHOC ÉLECTRIQUE - NE PAS OUVRIR.*
MOUNT IN RACK ONLY
INSTALLER SUR SUPPORT DE MONTAGE SEULEMENT.

Use proper power cord

To avoid fire hazard, use only the power cord specified for this product.

Ground the product

This is a Safety Class 1 product and is grounded through the grounding conductor of the power cord. To avoid electrical shock, the grounding conductor must be connected to earth ground. Before making connections to the product's input or output terminals, ensure the product is properly grounded.

WARNING: *THIS APPLIANCE MUST BE GROUNDED.*
WARNING: *THIS APPLIANCE MUST BE EARTHED.*

VARNING: *APPARATEN SKALL ANSLUTAS TILL JORDAT UTTAG NÄR DEN ANSLUTS TILL ETT N*ÄTVERK.

Do Not Operate Without Covers

To avoid electrical shock or fire hazard, do not operate this product with covers or panels removed.

Use Proper Fuse

To avoid fire hazard, use only the fuse type and rating specified for this product.

Do Not Operate in Wet/Damp Conditions

To avoid injury or fire hazard, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Avoid Exposed Circuitry

To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

Product Damage Precautions

CAUTION:

Disconnect power from the frame before removing or installing input/output modules. Removing or installing modules with power applied could cause serious damage to system components.

Use Proper Power Source

Do not operate this product from a power source that supplies more than the specified voltage.

Use Proper Voltage Settings

Before applying power, ensure that the line selector is in the proper position for the power source being used.

Provide Proper Ventilation

To prevent product overheating, provide proper ventilation.

Do Not Operate With Suspected Failures

If you suspect there is damage to this product, have it inspected by qualified service personnel.

CAUTION: *This unit can have more than one power supply cord. To de-energize the internal circuitry, you have to disconnect all power cords.*
ADVARSEL: *Utstyret kan ha mere ennn en tilførselsledning. For å gjore interne deler spennigsløse må alle tilførselsledningene trekkes ut.*

VARNING: Denna apparat har mer än en nätanslutning. Samtliga nätkablar måste bortkopplas för att göra de interna kretsarna spänningsfria.

FUSE: *REPLACE WITH SAME TYPE AND RATING OF FUSE.*

CAUTION: *REPLACE WITH SAME TYPE FUSE.*

ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE.

CAUTION: *DISCONNECT SUPPLY CORD BEFORE CHANGING FUSE.*
ATTENTION: *DÉBRANCHER AVANT DE REMPLACER LE FUSIBLE.*
ACHTUNG: *VOR AUSWECHSELN DER SICHERUNG IST DAS GERÄT VOM NETZ ZU TRENNEN.*

CAUTION:

Disconnect power from the frame before removing or installing input/output modules. Removing or installing modules with power applied could cause serious damage to system components.

Use Proper Power Source

Do not operate this product from a power source that supplies more than the specified voltage.

Battery Use Warnings

WARNING: Replace battery with CR2032 only. Use of another battery may present a risk of fire or explosion.

WARNING: Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

WARNING: Lithium battery. Danger of explosion if incorrectly replaced. Must only be replaced by a battery of same make and type. (Used batteries shall be returned to the supplier.)

ADVARSEL! Lithiumbatteri. Eksplosionsfare ved fejlagtig handtering. Udskiftning ma kun ske med batteri af samme fabrikat oq type. Lever det brugte batteri tilbage till leverandoren.

WARNING: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. (Discard used batteries according to manufacturer's instructions.)

VARNING: Explosionsfara vid felaktigt batteribyte. Anvand samma batteritlyp eller en eller en ekvivalent typ som rekommenderas av tillverkaren. Kassera anvant betteri enligt fabrikantens instruktion.

VARNING: Felaktigt batteribyte kan medfora fara for explosion. Anvand darfor endast samma typ eller likvardig typ enligt apparattillverkarens rekommendation. Kassera forbrukade batterier enligt tillverkarens anvisning.

Warranty

Leitch Incorporated ("Leitch") warrants to each original end-user purchaser or licensee (each, a "Customer") of hardware or software products manufactured by Leitch (each, a "Product"), or of non-warranty repair or other services provided by Leitch ("Services"), that each such Product and all such Services will be free from defects in materials and workmanship that adversely affect the Product's performance or the Services' intended purpose for a period (the "Warranty Period") of:

- One year for server hardware Products;
- Two years for non-server, and Desktop hardware Products;
- Ninety days for parts, assemblies and supplies to support hardware Products previously sold to Customers;
- Ninety days for media of software licensed separately from Leitch hardware Products, and encoding created by Leitch as physically affixed on or embedded in such media;
- The same period as the hardware Product warranty for media of software licensed as an integral part of any Leitch hardware Product, and encoding created by Leitch as physically affixed on or embedded in such media;
- Ninety days for Services.

Please refer to the current "Leitch Limited Warranty Policy" for a complete description of the warranty provided, including important exclusions and limitations as well as procedures for obtaining warranty service.